DMU-30ACV Series

Ruggedized True-rms ac Voltmeters with Daylight Readable, Auto-Dimming LED Displays

PATENT PENDING

FEATURES

- Measures and displays the true-rms value of complex ac voltages
- Three input ranges: 20Vac, 200Vac and 300Vac
- Daylight-readable LED display with automatic brightness adjustment
- Moisture & impact resistant package offers NEMA-4/IP65 protection
- Operates from universal 85-264Vac or 110-300Vdc
- Input circuit fully isolated from operating ac power source
- 47-1kHz input frequency range with crest factors up to 5
- UL certification pending

Murata Power Solutions' DMU-30ACV series of daylight-readable ac voltmeters measure and display the true-rms values of complex ac waveforms. Their large 0.56" (14.2mm) high super-bright red LED-display is readable in full sunlight. An auto-dimming circuit automatically adjusts the display brightness for all viewing conditions.

And all DMU-30ACV ac voltmeters are packaged in a plastic package with an integrated bezel and gasket assembly designed to meet NEMA-4/IP65 for moisture resistance in outdoor applications.

DMU-30ACV series rms voltmeters are available in a choice of three input ranges: 20Vac (with 0.01V resolution); 200Vac (0.1V resolution); and 300Vac (1V resolution). Because the input circuitry is electrically isolated from the unit's operating power source, these voltmeters can measure ac signals down to zero volts. An input frequency range of 47-1kHz makes these voltmeters ideal for all ac voltage monitoring applications. And, unlike conventional average-responding designs, these meters can measure and accurately display the true-rms value of triangle waves, square waves, or any other irregularly shaped waveform, with 0.4% full-scale accuracy.

DMU-30ACV series' miniature size and ruggedized package is perfect for all industrial and high-reliability instrumentation, alternative power generators, and any other application which requires precise ac line monitoring in harsh indoor/outdoor environments. Simply connect the input signal and an 85-264Vac source of operating power to the two rear-mounted terminal blocks and the unit is fully operational.

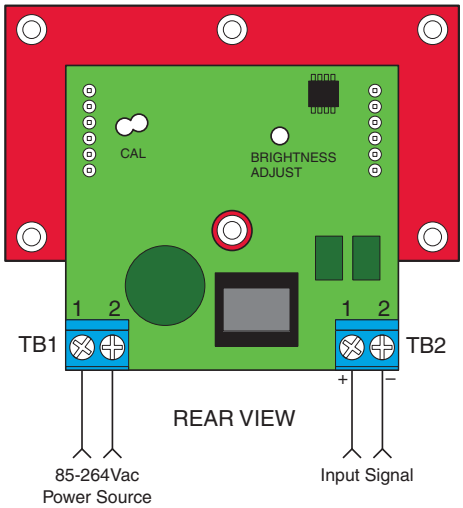

Figure 1. DMU-30ACV wiring diagram

TECHNICAL NOTES

IMPORTANT! To ensure safe and reliable operation, DMU-30ACV ac voltmeters must be installed and serviced by qualified technical personnel. Contact Murata Power Solutions / DATEL if there is any doubt regarding installation and/or operation.

1. **Measurement Type:** DMU-30ACV series ac voltmeters employ a precision rms-to-dc converter and a stable voltage reference to measure and display the rms value of complex ac waveforms. Crest factors as high as 5 produce minimal additional errors (see Performance Specifications).

2. **Wiring:** All ac supply and input signal wiring must be adequately rated for the voltages and currents they will carry, and must comply with any code or application-mandated requirements pertaining to the user's specific installation.

3. **Power Supply Polarity, Fusing, and Grounding:** The power supply inputs, (TB1 and TB1-2) on DMU-30ACV voltmeters are not polarity sensitive, that is, they have no "AC LO" or "AC HI" designations. These units do not include or require a connection to earth/chassis ground. Refer to Figure 1 for a typical wiring diagram.

   DMU-30ACV ac voltmeters are not internally fused. If fusing is required, it must be externally installed according to the supply wire's maximum amperage rating.

RoHS COMPLIANT 2002/95/EC

For full details go to www.murata-ps.com/rohs

TECHNICAL NOTES (continued)

4. Calibration: Periodic recalibration of DMU-30ACV voltmeters is not required under most indoor operating environments. However, units operating in environments subject to vibration and/or extreme temperature variations should have their accuracy verified on a yearly basis. If recalibration is necessary, it should only be performed by qualified technical personnel. Calibration is performed with potentially lethal voltages applied to the DMU-30ACV and its associated wiring. A plastic, fully-insulated adjusting tool must be used to access the recessed potentiometers located on the back of the unit (see Mechanical Specifications). Contact Murata / DATEL if additional information is required regarding calibration, setup, or any other technical issue pertaining to DMU-30ACV ac voltmeters.

5. Minimum-Intensity Adjustment Potentiometer: Users can adjust the DMU-30ACV's minimum LED display brightness to suit their indoor viewing requirements by adjusting the ¾-turn, rear-mounted intensity adjustment potentiometer. Please note, this potentiometer will have minimal impact on display brightness in high ambient light environments.

The intensity adjustment potentiometer is factory preset to its mid-point position. As viewed from the rear of the meter, and with the model number label facing up, turning the potentiometer clockwise increases the LED display's intensity. See the Mechanical Specifications section for potentiometer locations.

6. 2-Wire Operation: In indoor applications where daylight readability (i.e., maximum display brightness) is not required, DMU-30ACV meters will meet their specified accuracy with ac supply voltages (TB1) well below 85Vac. While performance is not guaranteed, DMU-30ACV voltmeters' remain easily readable and accurate with ac supplies as low as 20Vac in most indoor environments.

Please note, when operated indoors in a 2-wire mode (i.e., TB1 and TB2 are connected to the same ac voltage), DMU-30ACV series' input current will increase as the input supply is decreased. At 20Vac, the input supply current will be approximately 30mA.

Ordering Information

Model	Input Range
DMU-30ACV-0-DR-C	0 to 19.99Vac
DMU-30ACV-1-DR-C	0 to 199.9Vac
DMU-30ACV-2-DR-C	0 to 300Vac

Performance/Functional Specifications

Typical at T_A = +25°C, 60Hz sine-wave input, unless otherwise noted.

Input (TB2)	Min.	Typ.	Max.	Units
Full Scale Input Range:				
DMU-30ACV-0	0	–	19.99	Vac
DMU-30ACV-1	0	–	199.9	Vac
DMU-30ACV-2	0	–	300	Vac
Input-Voltage Frequency Range	47	60	1000	Hz
Performance				
Sampling Rate	2.5 readings per second			
Accuracy ①	±0.4%FS ±2 counts w/ 60Hz sine-wave input			
Measurement Type	RMS responding, Crest Factors of 1-5			
Zero Reading (within 30 sec.)	"–002"	"000"	"002"	Cnts
Temperature Drift (0 to +60°C)	–	±0.2	±0.4	Cnts/°C
Breakdown Voltage (TB1 to TB2)	2000	–	–	Vdc
Supply Voltage (TB1)				
DMU-30ACV	85	–	264	Vac/47-63Hz
Supply Current (TB1) ②				
DMU-30ACV (total darkness)	–	4	6	mA/47-63Hz
DMU-30ACV (full sunlight)	–	40	50	mA/47-63Hz
Terminal Block Wiring (TB1 & TB2)				
Wire Size	16-22 AWG, Solid or stranded			
Insulation Strip Length	0.250 inches (6.35)			
Screw Tightening Torque	3.6 pound-inches (0.4Nm)			
Rated Voltage	300Vac			
Display				
Display Type and Size	Daylight readable, auto-dimming, 3½ digit, 0.56"/14.2mm high red LED			
Decimal Point	Fixed, model dependent			
Overrange Indication	"1___"			
Physical/Environmental				
Operating Temperature	–25	–	+60	°C
Storage Temperature	–40	–	+75	°C
Humidity (non-condensing)	0	–	85	%
Dimensions	See mechanical specifications			
Weight	1.3 ounces (36 grams) nominal			

① Specified accuracy applies to inputs with crest factors (CF) up to 2.0, where CF = Vpeak/Vrms. Crest factors of 2-5 introduce an additional eror of ±3% of full scale. Voltmeters are calibrated with near full-scale, 60Hz sine-wave input.

② Display reading is set to "1888". Specified power supply currents are steady state; larger surge currents can occur at initial application of ac power. Power supply input (TB1) set to 120Vac/60 Hz.

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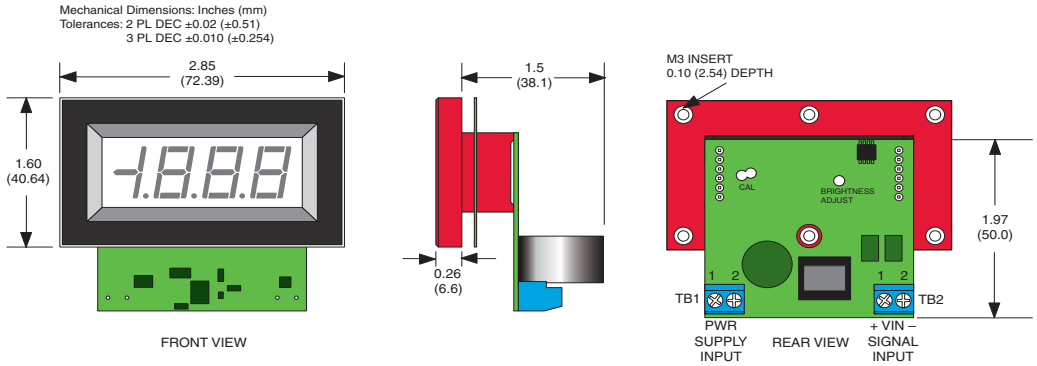
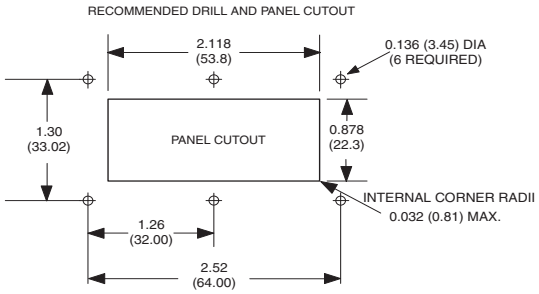
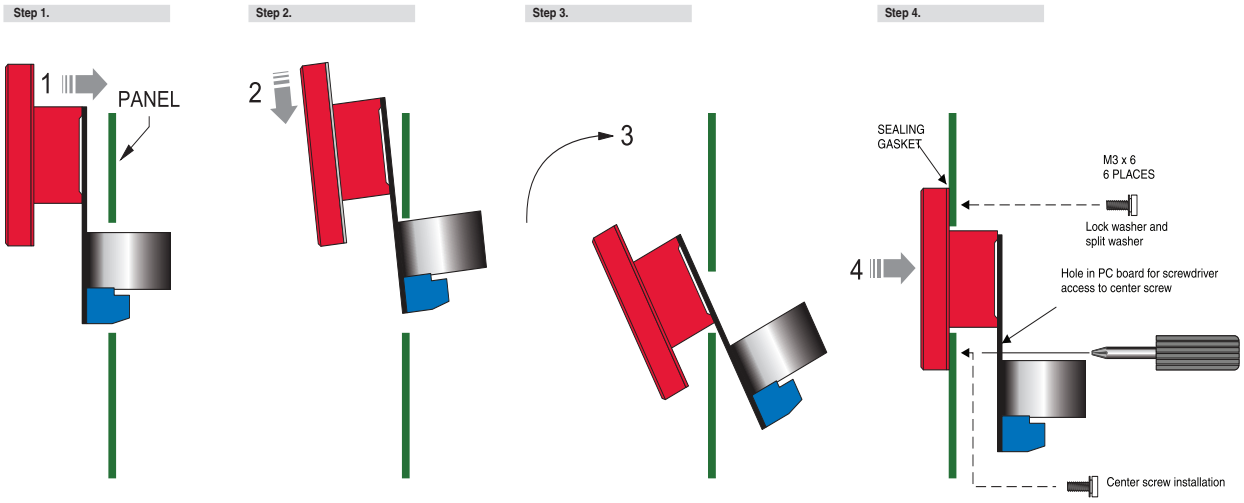


Note: The supplied screws and washers will accommodate panel thicknesses from 0.060 to 0.090 inches (1.52 to 2.28 mm).



PANEL INSTALLATION



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